

## CLAIMS

- 1.A payload launching system comprising a cable (14), an end portion of which is adapted for releasably coupling with a rocket (16), a rotary member (11) adapted for rotation on an axis (12) and drive means for disengageably engaging with the rotary member (11) so as to rotate the rotary member (11) on the axis (12), and the rotary member (11) is provided with a surface (13) for receiving a portion of the cable (14) remote from a rocket (16), and the surface (13) has a curved profile, the radial dimension of which increases progressively from the said axis (12) in an arcuate direction of the said axis (12), and means for engaging a portion of the said cable (14) remote from a rocket (16) with the rotary member (11), while the said rotary member is rotating, so that the portion of the said cable (14) remote from a rocket (16) locates on the said surface (13), while an end portion of the said cable (14) remote from a rocket (16) is restrained at a location on the rotary member (11) adjacent to a centre of the rotary member (11), characterised in that there is provided transferring means (15) between the cable (14) and a rocket (16), said transferring means (15) adapted to transfer the pulling force from the cable (14) to said rocket (16).
- 2.A payload launching system comprising a cable (27), an end portion of which is adapted for releasably coupling with a rocket (29), a rotary member (21) adapted for rotation on an axis (22) and drive means for disengageably engaging with the rotary member (21) so as to rotate the rotary member (21) on the axis (22), and an additional rotary member (25) adapted for rotation on a second axis (26), and an end portion of the said cable (27) remote from the rocket (29) is attached to the additional rotary member (25), and a second cable (24), an end portion of which is attached to the additional rotary member (25), and the rotary member (21) is provided with a surface (23) for receiving a portion of the said cable (24) remote from the additional rotary member (25), and the surface (23) has a curved profile, the radial dimension of which increases progressively from the said axis (22) in an arcuate direction of the said axis (22), and means for engaging a portion of the said cable (24) remote from the said additional rotary member (25) with the said rotary member (21), while the said rotary member (21) is rotating, so that the portion of the said cable (24) remote from the said additional rotary member (25) locates on the said surface (23) while the end portion of the said cable (24) remote from the additional rotary member (25) is restrained at a location on the rotary member (21) adjacent to a centre of the rotary member (21), characterised in that there is provided transferring means (28) between the cable (27) and a rocket (29), said transferring means (28) adapted to transfer the pulling force from the cable (27) to said rocket (29).
- 3.A payload launching system as described in claim 1 or claim 2, characterised in that there is provided a rocket (16,29) adapted to be accelerated by the system.
- 4.A payload launching system as described in any of the preceding claims, characterised in that the transferring means (15,28) are adapted to transfer the pulling force from the cable (14,27) to the rocket (16,29) at at least a point located after the first stage of the rocket (16,29).
- 5.A payload launching system as described in any of the preceding claims, characterised in that the transferring means (15,28) are adapted to transfer the pulling force from the cable (14,27) to the rocket (16,29) at at least a point located after the second stage of the rocket (16,29).
- 6.A payload launching system as described in any of the preceding claims, characterised in that the transferring means (15,28) are adapted to transfer the pulling force from the cable (14,27) to the rocket (16,29) at at least a point located after a payload carried by the rocket (16,29).
- 7.A payload launching system as described in any of the preceding claims, characterised in that there is provided means for disconnecting the cable (14,27) from at least a transferring means (15,28).

8.A payload launching system as described in any of the preceding claims, characterised in that the means for disconnecting the cable (14,27) from at least a transferring means (15,28) include an explosive device.

- 5 9.A payload launching system as described in any of claims 3 to 8, characterised in that the rocket (16,29) comprises at least a point on its structure where at least a transferring means (15,28) is able to transfer the pulling force from the cable (14,27) to the rocket (16,29).

- 10 10.A payload launching system as described in any of the claims 3 to 9, characterised in that the rocket (16,29) comprises points on its structure where at least a transferring means is attached to the rocket (16,29).

- 15 11.A payload launching system as described in any of the preceding claims, characterised in that there is provided means for detaching a transferring means (15,28) from the rocket (16,29).

- 20 12.A payload launching system as described in any of the preceding claims, characterised in that the means for detaching a transferring means (15,28) from the rocket (16,29) include an explosive device.

13.A payload launching system as described in any of the preceding claims, characterised in that there is provided means for moving a transferring means (15,28) away from the rocket (16,29) so that the rocket (16,29) is able to continue its trajectory unobstructed by it.

- 25 14.A payload launching system as described in any of the preceding claims, characterised in that the means for moving a transferring means (15,28) away from the rocket (16,29) include an aerodynamic structure located on a transferring means (15,28).